

What is claimed is:

1. A semiconductor integrated circuit for high frequency power amplifier comprising a semiconductor chip,

wherein said semiconductor chip includes thereover:

a current detection circuit having a transistor for output detection which receives a signal from a power amplification circuit for amplifying modulated high frequency signals and detects the current of the power amplification circuit;

a current-voltage conversion circuit which converts the detection current of the current detection circuit into voltage;

an error amplification circuit which compares the voltage obtained by conversion by the current-voltage conversion circuit with an output level instruction signal and outputs a signal corresponding to the difference between them; and

a bias generation circuit which supplies bias to said power amplification circuit based on the output of the error amplification circuit, and

wherein said error amplification circuit includes: a differential amplification circuit; a first resistance element; a second resistance element; and a capacitive element, the second resistance element and the capacitive element being connected in series in parallel with the first resistance

element, and the first resistance element, the second resistance element, and the capacitive element being connected between the output terminal and inverting input terminal of the differential amplification circuit.

2. The semiconductor integrated circuit for high frequency power amplifier according to Claim 1,

wherein said current-voltage conversion circuit is a square root conversion circuit which converts an input current into an current which is the square root of the input current.

3. The semiconductor integrated circuit for high frequency power amplifier according to Claim 2,

wherein said square root conversion circuit is a circuit which comprises field-effect transistors, is fed with said detection current and a reference current as input signals, and outputs a current which is the square root of the product of the detection current and the reference current.

4. The semiconductor integrated circuit for high frequency power amplifier according to Claim 1,

wherein the noninverting input terminal of said error amplification circuit is provided with an attenuator, and voltage obtained by dividing said output level instruction signal by the attenuator is inputted.

5. The semiconductor integrated circuit for high frequency power amplifier according to Claim 1,

wherein said bias generation circuit is a resistance type voltage division circuit comprising a plurality of resistance elements.

6. An electronic component for high frequency power amplifier comprising an insulating substrate,

wherein said insulating substrate includes thereover:

a power amplification circuit which amplifies modulated high frequency signals;

a current detection circuit having a transistor for output detection which receives a signal from the power amplification circuit and detects the current of the power amplification circuit;

a current-voltage conversion circuit which converts the detection current of the current detection circuit into voltage;

an error amplification circuit which compares the voltage obtained by conversion by the current-voltage conversion circuit with an output level instruction signal and outputs a signal corresponding to the difference between them; and

a bias generation circuit which supplies bias to said power amplification circuit based on the output of the error

amplification circuit, and

wherein said error amplification circuit includes: a differential amplification circuit; a first resistance element; a second resistance element; and a capacitive element, the second resistance element and the capacitive element being connected in series in parallel with the first resistance element, and the first resistance element, the second resistance element, and the capacitive element being connected between the output terminal and inverting input terminal of the differential amplification circuit.

7. The electronic component for high frequency power amplifier according to Claim 6,

wherein said power amplification circuit comprises a plurality of transistors for power amplifier in cascade connection, and said current detection circuit receives the input signal of the transistor for power amplifier in the final stage and outputs a current in proportion to the output current.

8. The electronic component for high frequency power amplifier according to Claim 7,

wherein an impedance matching circuit is provided between the input terminal and the transistor for power amplifier in the first stage, between the transistors for power amplifier in the individual stages, and between the transistor for power

amplifier in the final stage and the output terminal,

wherein said transistors for power amplifier, said current detection circuit, the current-voltage conversion circuit, and the error amplification circuit are formed over one or more semiconductor chips, and

wherein said impedance matching circuits are formed over an insulating substrate over which said semiconductor chips are mounted.

9. The electronic component for high frequency power amplifier according to Claim 6,

wherein said current-voltage conversion circuit is a square root conversion circuit which converts an input current into a current which is the square root of the input current.

10. The electronic component for high frequency power amplifier according to Claim 6,

wherein the noninverting input terminal of said error amplification circuit is provided with an attenuator, and voltage obtained by dividing said output level instruction signal by the attenuator is inputted.

11. A radio communication system comprising:

the electronic component for high frequency power amplifier according to Claim 6;

a second electronic component comprising a transmission/reception changeover circuit which switches between transmission signal and reception signal;

a third electronic component which modulates a signal to be transmitted and inputs the signal to said electronic component for high frequency power amplifier; and

a semiconductor integrated circuit for control which generates and supplies a control signal to each of said electronic components,

wherein said output level instruction signal is supplied from said semiconductor integrated circuit for control to said electronic component for high frequency power amplifier.

12. The radio communication system according to Claim 11, wherein said electronic component for high frequency power amplifier comprises a first power amplification circuit for amplifying signals in a first frequency band and a second power amplification circuit for amplifying signals in a second frequency band, said second electronic component comprises a signal changeover means which switches between signals in the first frequency band and signals in the second frequency band; said third electronic component comprises a circuit for modulating signals in the first frequency band and a circuit for modulating signals in the second frequency band, and at least said current detection circuit, said current-voltage

conversion circuit, and said error amplification circuit are provided as circuits common to said first power amplification circuit and said second power amplification circuit.

13. The radio communication system according to Claim 11, wherein a changeover signal for controlling the state of said transmission/reception changeover circuit is supplied from said semiconductor integrated circuit for control to said second electronic component, and a signal for controlling the operating state of said first power amplification circuit and said second power amplification circuit in said electronic component for high frequency power amplifier according to said changeover signal is supplied from said semiconductor integrated circuit for control to said electronic component for high frequency power amplifier.